

Name _____

Check out this page to fill in the answers:

<http://www.pbs.org/wgbh/buildingbig/bridge/basics.html>

You may have to click on links on the page to fill in the blanks.

Name the four types of bridges and give an example of each: (the first is done for you)

1. beam bridge
example: Chesapeake Bay Bridge – Tunnel
2. _____
example: _____
3. _____
example: _____
4. _____
example: _____

Fill in the blanks:

1. Arch bridges are difficult to build since the structure is completely unstable until the two _____ meet in the middle. Engineers used to use a technique called _____ in which a wooden form would support the spans until they locked together at the top.
2. _____, like the Sunshine Skyway in Florida, require less cable and can be built much faster than suspension bridges.
3. A _____ has a deck that rotates around a center point; a _____ has a deck that can be raised and lowered.
4. The Firth of Forth Bridge in Scotland is a _____ bridge, a complex version of the truss bridge.

Now go to

<http://www.pbs.org/wgbh/buildingbig/lab/index.html>

Do the Forces Lab to answer these questions:

1. _____ is a force that squeezes a material together. When a material is in _____, it tends to become shorter.
2. When a straight material becomes curved, one side _____ together and the other side _____ apart. This action is called bending.
3. _____ is a force that causes parts of a material to slide past one another in opposite directions.

4. _____ is an action that twists a material.

5. Tension is a force that stretches a material _____. When a material is in tension, it tends to become _____.

Do the Loads Lab to do the following matching activity:

Dead Load things that move around in or on a structure (i.e. people, cars, etc.)

Live Load weight of the structure

Dynamic Load

Wind Load structures will sink and change shape when they experience this

Thermal Load also known as seismic load

Earthquake Failure create vibrations that can be bigger and more dangerous over time

Settlement Failure pushes horizontally on a structure

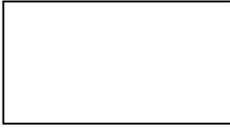
causes beams and columns to change shape and push and pull on other parts of the structure

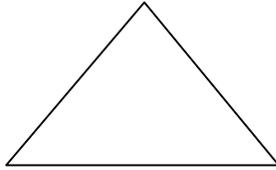
Now do the materials lab to do the following matching activity:

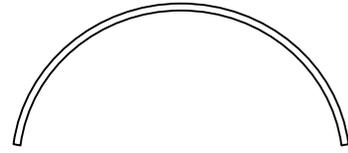
Wood	the steel bars inside make it very strong in tension - that's why some of the tallest skyscrapers in the world are made of this
Plastic	Strengths: Molds to any shape, strong in compression Weaknesses: Weaker than steel in tension, breaks without warning
Aluminum	Weaknesses: Rots, swells and burns easily
Brick	Ingredients: Cement, water, small stones
Concrete	Applications: Umbrellas, inflatable roofs over sports arenas Example: Georgia Dome -- Atlanta, Georgia
Reinforced Concrete	when combined with metals like magnesium and copper, it is almost as strong as steel
Cast Iron	Applications: walls of early skyscrapers and tunnels, domes Example: Original Thames Tunnel -- London, England
Steel	because this is stronger than any other material in tension - That's why the cables in the Golden Gate Bridge are made of this

Now do the shapes lab:

Rank the shapes in terms of strength from strongest to weakest (1 to 3):







Finally, do the bridge challenge

(<http://www.pbs.org/wgbh/buildingbig/bridge/challenge/index.html>)

Indicate which bridge goes with which location:

Location 1: _____

Location 2: _____

Location 3: _____

Location 4: _____